

## **AMENDMENTS TO THE CLAIMS**

The following listing of claims will replace all prior versions and listings of claims in the application.

### **LISTING OF CLAIMS**

1. (Currently Amended) A computerized method for authenticating an electronic file, the method comprising the steps of:  
  
receiving an electronic file having a graphical content;  
  
generating an object level representation of the graphical content; and  
  
adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains ~~binary~~ one bit per pixel values.
2. (Cancelled)
3. (Original) The method of claim 1 further comprising the step of converting the graphical content into a symbolic representation of the graphical content.
4. (Original) The method of claim 3 further comprising the steps of:  
  
defining nodes of the graphical content with specification symbols; and  
  
defining relationships between the nodes of the graphical content with relationship symbols.

5. (Original) The method of claim 4 further comprising the step of defining the shape, size, color, and position of the nodes.

6. (Original) The method of claim 4 further comprising the step of defining conditions and familial relationships between the nodes.

7. (Currently Amended) ~~The method of claim 1 further comprising the step of~~  
A computerized method for authenticating an electronic file, the method comprising the steps of:

receiving an electronic file having a graphical content;

generating an object level representation of the graphical content;

adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values; and

authenticating the object level representation with a text authentication algorithm.

8. (Currently Amended) ~~The method of claim 7 further comprising the step of~~  
A computerized method for authenticating an electronic file, the method comprising the steps of:

receiving an electronic file having a graphical content;

generating an object level representation of the graphical content;

adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values;

authenticating the object level representation with a text authentication algorithm;  
and  
authenticating the object level representation with a checksum.

9. (Currently Amended) ~~The method of claim 8~~ A computerized method for authenticating an electronic file, the method comprising the steps of:

receiving an electronic file having a graphical content;  
generating an object level representation of the graphical content;  
adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values;

authenticating the object level representation with a text authentication algorithm;  
and  
authenticating the object level representation with a checksum, wherein the checksum is a two-dimensional checksum.

10. (Currently Amended) ~~The method of claim 8~~ A computerized method for authenticating an electronic file, the method comprising the steps of:

receiving an electronic file having a graphical content;  
generating an object level representation of the graphical content;

adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values;

authenticating the object level representation with a text authentication algorithm;  
and

authenticating the object level representation with a checksum, wherein the checksum is a multi-dimensional checksum.

11. (Currently Amended) ~~The method of claim 7 further comprising the step of~~  
A computerized method for authenticating an electronic file, the method comprising the steps of:

receiving an electronic file having a graphical content;  
generating an object level representation of the graphical content;  
adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values;

authenticating the object level representation with a text authentication algorithm;  
and

authenticating the object level representation with a cryptographic hash function.

12. (Original) The method of claim 1 further comprising the step of authenticating the graphical content at a pixel level.

13. (Original) The method of claim 12 further comprising the step of adding visible authentication information to the graphical content.

14. (Currently Amended) ~~The method of claim 13~~ A computerized method for authenticating an electronic file, the method comprising the steps of:  
receiving an electronic file having a graphical content;  
generating an object level representation of the graphical content;  
adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values;  
authenticating the graphical content at a pixel level; and  
adding visible authentication information to the graphical content, wherein the visible authentication information includes a bounding box.

15. (Currently Amended) ~~The method of claim 13~~ A computerized method for authenticating an electronic file, the method comprising the steps of:  
receiving an electronic file having a graphical content;  
generating an object level representation of the graphical content;  
adding authentication information to the electronic file based on the object level representation of the graphical content, wherein the graphical content contains one bit per pixel values;  
authenticating the graphical content at a pixel level; and

adding visible authentication information to the graphical content, wherein the visible authentication information includes a bar code.

16. (Original) The method of claim 12 further comprising the step of adding invisible authentication information to the graphical content.

17. (Original) The method of claim 1 further comprising the step of partitioning the electronic file into graphical content and textural content.

18. (Currently Amended) A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;

authenticating the graph at an object level; and

encrypting the authenticated graph; and

transmitting the authenticated graph to a recipient.

19. (Original) The method of claim 18 further comprising the step of adding visible authentication information to the graph.

20. (Currently Amended) ~~The method of claim 19 further~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;

authenticating the graph at an object level;

encrypting the authenticated graph;  
transmitting the authenticated graph to a recipient;  
adding visible authentication information to the graph; and  
forming a truncated image from the graph;  
generating an initial message from the truncated image, the initial message defined by all bits of the truncated image;  
converting the initial message into a padded message, the padded message having a size defined by a multiple of a predetermined length;  
computing a hash value for the padded message;  
converting the hash value into a public key encrypted message; and  
converting the public key encrypted message into the visible authentication information.

21. (Currently Amended) ~~The method of claim 20~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;  
authenticating the graph at an object level;  
encrypting the authenticated graph;  
transmitting the authenticated graph to a recipient;  
adding visible authentication information to the graph; and  
forming a truncated image from the graph;  
generating an initial message from the truncated image, the initial message defined by all bits of the truncated image;

converting the initial message into a padded message, the padded message having a size defined by a multiple of a predetermined length;  
computing a hash value for the padded message;  
converting the hash value into a public key encrypted message; and  
converting the public key encrypted message into the visible authentication information, wherein the visible authentication information includes a bounding box.

22. (Currently Amended) ~~The method of claim 20~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;  
authenticating the graph at an object level;  
encrypting the authenticated graph;  
transmitting the authenticated graph to a recipient;  
adding visible authentication information to the graph; and  
forming a truncated image from the graph;  
generating an initial message from the truncated image, the initial message defined by all bits of the truncated image;  
converting the initial message into a padded message, the padded message having a size defined by a multiple of a predetermined length;  
computing a hash value for the padded message;  
converting the hash value into a public key encrypted message; and  
converting the public key encrypted message into the visible authentication information, wherein the visible authentication information includes a bar code.



23. (Original) The method of claim 18 further comprising the step of adding invisible authentication information to the graph.

24. (Currently Amended) ~~The method of claim 23 further comprising the steps of:~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;

authenticating the graph at an object level;

encrypting the authenticated graph;

transmitting the authenticated graph to a recipient;

adding invisible authentication information to the graph;

forming a truncated image from the graph;

selecting a verification bit from each pixel of the truncated image;

generating an initial message from the truncated image, the initial message defined by all non-verification bits of the truncated image;

converting the initial message into a padded message, the padded message having a size defined by a multiple of a predetermined length;

computing a hash value for the padded message;

converting the hash value into a public key encrypted message; and

embedding the public key encrypted message into the truncated image.

25. (Currently Amended) ~~The method of claim 24 further comprising the step of comprising the steps of:~~

A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;

authenticating the graph at an object level;

encrypting the authenticated graph;

transmitting the authenticated graph to a recipient;

adding invisible authentication information to the graph;

forming a truncated image from the graph;

selecting a verification bit from each pixel of the truncated image;

generating an initial message from the truncated image, the initial message defined by all non-verification bits of the truncated image;

converting the initial message into a padded message, the padded message having a size defined by a multiple of a predetermined length;

computing a hash value for the padded message;

converting the hash value into a public key encrypted message;

embedding the public key encrypted message into the truncated image; and

maximizing spread between the verification bits.

26. (Currently Amended) ~~The method of claim 18 further comprising the step of~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;  
authenticating the graph at an object level;  
encrypting the authenticated graph;  
transmitting the authenticated graph to a recipient; and  
authenticating a symbolic representation of the graph with a text authentication algorithm.

27. (Currently Amended) ~~The method of claim 26 further comprising the steps of;~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;  
authenticating the graph at an object level;  
encrypting the authenticated graph;  
transmitting the authenticated graph to a recipient;  
authenticating a symbolic representation of the graph with a text authentication algorithm;

defining nodes of the graph with specification symbols; and  
defining relationships between the nodes of the graph with relationship symbols.

28. (Currently Amended) ~~The method of claim 26 further comprising the step of comprising the steps of;~~ A computerized method for authenticating a binary graph, the method comprising the steps of:

authenticating the graph at a pixel level;

authenticating the graph at an object level;  
encrypting the authenticated graph;  
transmitting the authenticated graph to a recipient;  
authenticating a symbolic representation of the graph with a text authentication  
algorithm; and  
coalescing the object level of the graph with the pixel level of the graph.

29. (Currently Amended) A graph authentication system comprising:  
an electronic file for receiving a graphical content;  
an object level authenticator for authenticating a graph at an object level;  
a pixel level authenticator for authenticating the graph at a pixel level; ~~and~~  
an encryption system for encrypting the authenticated graph-; and  
a recipient for receiving the authenticated graph.

30. (Original) The authentication system of claim 29 wherein the object level authenticator converts the graph into a symbolic representation of the graph.

31. (Original) The authentication system of claim 30 wherein the object level authenticator includes:

a specification module for defining nodes of the graph with specification symbols;  
a relationship module for defining relationships between the nodes of the graph with relationship symbols; and  
a text authentication module for authenticating the symbolic representation with a

text authentication algorithm.

32. (Original) The authentication system of claim 29 wherein the pixel level authenticator includes:

a visible watermarking module for adding visible authentication information to the graph; and

an invisible watermarking module for adding invisible authentication information to the graph.

33. (Original) The authentication system of claim 32 wherein the pixel level authenticator further includes a coalescing module for embedding a hash value from the object level of the graph in the pixel level of the graph.